

SEQUENCE LISTING

<110> Soderlund, David M.

Knipple, Douglas C.

Ingles, Patricia J.

<120> INSECT SODIUM CHANNELS FROM INSECTICIDE-SUSCEPTIBLE AND
INSECTICIDE-RESISTANT HOUSE FLIES

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Glu Asn Asp Gly Glu Ser Tyr Pro Val Cys Gly Asn Val Ser Gly Ala
325 330 335

Gly Gln Cys Gly Glu Asp Tyr Val Cys Leu Gln Gly Phe Gly Pro Asn
340 345 350

Pro Asn Tyr Asp Tyr Thr Ser Phe Asp Ser Phe Gly Trp Ala Phe Leu
355 360 365

Ser Ala Phe Arg Leu Met Thr Gln Asp Phe Trp Glu Asp Leu Tyr Gln
370 375 380

His Val Leu Gln Ala Ala Gly Pro Trp His Met Leu Phe Phe Ile Val
385 390 395 400

Ile Ile Phe Leu Gly Ser Phe Tyr Leu Val Asn Leu Ile Leu Ala Ile
405 410 415

Val Ala Met Ser Tyr Asp Glu Leu Gln Lys Lys Ala Glu Glu Glu
420 425 430

Ala Ala Glu Glu Ala Ile Arg Glu Ala Glu Glu Ala Ala Ala Ala
435 440 445

Lys Ala Ala Lys Leu Glu Glu Arg Ala Asn Val Ala Ala Gln Ala Ala
450 455 460

Gln Asp Ala Ala Asp Ala Ala Ala Ala Leu His Pro Glu Met Ala
465 470 475 480

Lys Ser Pro Thr Tyr Ser Cys Ile Ser Tyr Glu Leu Phe Val Gly Gly
485 490 495

Glu Lys Gly Asn Asp Asp Asn Asn Lys Glu Lys Met Ser Ile Arg Ser
500 505 510

Val Glu Val Glu Ser Glu Ser Val Ser Val Ile Gln Arg Gln Pro Ala
515 520 525

Pro Thr Thr Ala Pro Ala Thr Lys Val Arg Lys Val Ser Thr Thr Ser
530 535 540

Leu Ser Leu Pro Gly Ser Pro Phe Asn Leu Arg Arg Gly Ser Arg Ser
545 550 555 560

Ser His Lys Tyr Thr Ile Arg Asn Gly Arg Gly Arg Phe Gly Ile Pro
565 570 575

Gly Ser Asp Arg Lys Pro Leu Val Leu Gln Thr Tyr Gln Asp Ala Gln
580 585 590

Gln His Leu Pro Tyr Ala Asp Asp Ser Asn Ala Val Thr Pro Met Ser
595 600 605

Glu Glu Asn Gly Ala Ile Ile Val Pro Ala Tyr Tyr Cys Asn Leu Gly
610 615 620

Ser Arg His Ser Ser Tyr Thr Ser His Gln Ser Arg Ile Ser Tyr Thr
625 630 635 640

Ser His Gly Asp Leu Leu Gly Gly Met Ala Ala Met Gly Ala Ser Thr
645 650 655

Met Thr Lys Glu Ser Lys Leu Arg Ser Arg Asn Thr Arg Asn Gln Ser
660 665 670

Ile Gly Ala Ala Thr Asn Gly Gly Ser Ser Thr Ala Gly Gly Tyr
675 680 685

Pro Asp Ala Asn His Lys Glu Gln Arg Asp Tyr Glu Met Gly Gln Asp
690 695 700

Tyr Thr Asp Glu Ala Gly Lys Ile Lys His His Asp Asn Pro Phe Ile
705 710 715 720

Glu Pro Val Gln Thr Gln Thr Val Val Asp Met Lys Asp Val Met Val
725 730 735

Leu Asn Asp Ile Ile Glu Gln Ala Ala Gly Arg His Ser Arg Ala Ser
740 745 750

Glu Arg Gly Glu Asp Asp Asp Glu Asp Gly Pro Thr Phe Lys Asp Ile
755 760 765

Ala Leu Glu Tyr Ile Leu Lys Gly Ile Glu Ile Phe Cys Val Trp Asp
770 775 780

Cys Cys Trp Val Trp Leu Lys Phe Gln Glu Trp Val Ser Phe Ile Val
785 790 795 800

Phe Asp Pro Phe Val Glu Leu Phe Ile Thr Leu Cys Ile Val Val Asn
805 810 815

Thr Met Phe Met Ala Met Asp His His Asp Met Asn Pro Glu Leu Glu
820 825 830

Lys Val Leu Lys Ser Gly Asn Tyr Phe Phe Thr Ala Thr Phe Ala Ile
835 840 845

Glu Ala Ser Met Lys Leu Met Ala Met Ser Pro Lys Tyr Tyr Phe Gln
850 855 860

Glu Gly Trp Asn Ile Phe Asp Phe Ile Ile Val Ala Leu Ser Leu Leu
865 870 875 880

Glu Leu Gly Leu Glu Gly Val Gln Gly Leu Ser Val Leu Arg Ser Phe
885 890 895

Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn
900 905 910

Leu Leu Ile Ser Ile Met Gly Arg Thr Met Gly Ala Leu Gly Asn Leu
915 920 925

Thr Phe Val Leu Cys Ile Ile Ile Phe Ile Phe Ala Val Met Gly Met
930 935 940

Gln Leu Phe Gly Lys Asn Tyr Ile Asp His Lys Asp Arg Phe Lys Asp
945 950 955 960

His Glu Leu Pro Arg Trp Asn Phe Thr Asp Phe Met His Ser Phe Met
965 970 975

Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile Glu Ser Met Trp Asp
980 985 990

Cys Met Tyr Val Gly Asp Val Ser Cys Ile Pro Phe Phe Leu Ala Thr
995 1000 1005

Val Val Ile Gly Asn Leu Val Val Leu Asn Leu Phe Leu Ala Leu Leu
1010 1015 1020

Leu Ser Asn Phe Gly Ser Ser Ser Leu Ser Ala Pro Thr Ala Asp Asn
1025 1030 1035 1040

Asp Thr Asn Lys Ile Ala Glu Ala Phe Asn Arg Ile Ala Arg Phe Lys
1045 1050 1055

Asn Trp Val Lys Arg Asn Ile Ala Asp Cys Phe Lys Leu Ile Arg Asn
1060 1065 1070

Lys Leu Thr Asn Gln Ile Ser Asp Gln Pro Ser Glu His Gly Asp Asn
1075 1080 1085

Glu Leu Glu Leu Gly His Asp Glu Ile Met Gly Asp Gly Leu Ile Lys
1090 1095 1100

Lys Gly Met Lys Gly Glu Thr Gln Leu Glu Val Ala Ile Gly Asp Gly
1105 1110 1115 1120

Met Glu Phe Thr Ile His Gly Asp Met Lys Asn Asn Lys Pro Lys Lys
1125 1130 1135

Ser Lys Phe Met Asn Asn Thr Thr Met Ile Gly Asn Ser Ile Asn His
1140 1145 1150

Gln Asp Asn Arg Leu Glu His Glu Leu Asn His Arg Gly Leu Ser Ile
1155 1160 1165

Gln Asp Asp Asp Thr Ala Ser Ile Asn Ser Tyr Gly Ser His Lys Asn
1170 1175 1180

Arg Pro Phe Lys Asp Glu Ser His Lys Gly Ser Ala Glu Thr Ile Glu
1185 1190 1195 1200

Gly Glu Glu Lys Arg Asp Val Ser Lys Glu Asp Leu Gly Leu Asp Glu
1205 1210 1215

Glu Leu Asp Glu Glu Ala Glu Gly Asp Glu Gly Gln Leu Asp Gly Asp
1220 1225 1230

Ile Ile Ile His Ala Gln Asn Asp Asp Glu Ile Ile Asp Asp Tyr Pro
1235 1240 1245

Ala Asp Cys Phe Pro Asp Ser Tyr Tyr Lys Lys Phe Pro Ile Leu Ala
1250 1255 1260

Gly Asp Glu Asp Ser Pro Phe Trp Gln Gly Trp Gly Asn Leu Arg Leu
1265 1270 1275 1280

Lys Thr Phe Gln Leu Ile Glu Asn Lys Tyr Phe Glu Thr Ala Val Ile
1285 1290 1295

Thr Met Ile Leu Met Ser Ser Leu Ala Leu Ala Leu Glu Asp Val His
1300 1305 1310

Leu Pro Asp Arg Pro Val Met Gln Asp Ile Leu Tyr Tyr Met Asp Arg
1315 1320 1325

Ile Phe Thr Val Ile Phe Phe Leu Glu Met Leu Ile Lys Trp Leu Ala
1330 1335 1340

Leu Gly Phe Lys Val Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe
1345 1350 1355 1360

Val Ile Val Met Leu Ser Leu Ile Asn Leu Val Ala Val Trp Ser Gly
1365 1370 1375

Leu Asn Asp Ile Ala Val Phe Arg Ser Met Arg Thr Leu Arg Ala Leu
1380 1385 1390

Arg Pro Leu Arg Ala Val Ser Arg Trp Glu Gly Met Lys Val Val Val
1395 1400 1405

Asn Ala Leu Val Gln Ala Ile Pro Ser Ile Phe Asn Val Leu Leu Val
1410 1415 1420

Cys Leu Ile Phe Trp Leu Ile Phe Ala Ile Met Gly Val Gln Leu Phe
1425 1430 1435 1440

Ala Gly Lys Tyr Phe Lys Cys Lys Asp Gly Asn Asp Thr Val Leu Ser
1445 1450 1455

His Glu Ile Ile Pro Asn Arg Asn Ala Cys Lys Ser Glu Asn Tyr Thr
1460 1465 1470

Trp Glu Asn Ser Ala Met Asn Phe Asp His Val Gly Asn Ala Tyr Leu
1475 1480 1485

Cys Leu Phe Gln Val Ala Thr Phe Lys Gly Trp Ile Gln Ile Met Asn
1490 1495 1500

Asp Ala Ile Asp Ser Arg Glu Val Asp Lys Gln Pro Ile Arg Glu Thr
1505 1510 1515 1520

Asn Ile Tyr Met Tyr Leu Tyr Phe Val Phe Phe Ile Ile Phe Gly Ser
1525 1530 1535

Phe Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn
1540 1545 1550

Glu Gln Lys Lys Lys Ala Gly Gly Ser Leu Glu Met Phe Met Thr Glu
1555 1560 1565

Asp Gln Lys Lys Tyr Tyr Asn Ala Met Lys Lys Met Gly Ser Lys Lys
1570 1575 1580

Pro Leu Lys Ala Ile Pro Arg Pro Arg Trp Arg Pro Gln Ala Ile Val
1585 1590 1595 1600

Phe Glu Ile Val Thr Asp Lys Lys Phe Asp Ile Ile Ile Met Leu Phe
1605 1610 1615

Ile Gly Leu Asn Met Phe Thr Met Thr Leu Asp Arg Tyr Asp Ala Ser
1620 1625 1630

Glu Ala Tyr Asn Asn Val Leu Asp Lys Leu Asn Gly Ile Phe Val Val
1635 1640 1645

Ile Phe Ser Gly Glu Cys Leu Leu Lys Ile Phe Ala Leu Arg Tyr His
1650 1655 1660

Tyr Phe Lys Glu Pro Trp Asn Leu Phe Asp Val Val Val Val Ile Leu
1665 1670 1675 1680

Ser Ile Leu Gly Leu Val Leu Ser Asp Ile Ile Glu Lys Tyr Phe Val
1685 1690 1695

Ser Pro Thr Leu Leu Arg Val Val Arg Val Ala Lys Val Gly Arg Val
1700 1705 1710

Leu Arg Leu Val Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala
1715 1720 1725

Leu Ala Met Ser Leu Pro Ala Leu Phe Asn Ile Cys Leu Leu Leu Phe
1730 1735 1740

Leu Val Met Phe Ile Phe Ala Ile Phe Gly Met Ser Phe Phe Met His
1745 1750 1755 1760

Val Lys Glu Lys Ser Gly Ile Asn Ala Val Tyr Asn Phe Lys Thr Phe
1765 1770 1775

Gly Gln Ser Met Ile Leu Leu Phe Gln Met Ser Thr Ser Ala Gly Trp
1780 1785 1790

Asp Gly Val Leu Asp Ala Ile Ile Asn Glu Glu Asp Cys Asp Pro Pro
1795 1800 1805

Asp Asn Asp Lys Gly Tyr Pro Gly Asn Cys Gly Ser Ala Thr Val Gly
1810 1815 1820

Ile Thr Phe Leu Leu Ser Tyr Leu Val Ile Ser Phe Leu Ile Val Ile
1825 1830 1835 1840

Asn Met Tyr Ile Ala Val Ile Leu Glu Asn Tyr Ser Gln Ala Thr Glu
1845 1850 1855

Asp Val Gln Glu Gly Leu Thr Asp Asp Asp Tyr Asp Met Tyr Tyr Glu
1860 1865 1870

Ile Trp Gln Gln Phe Asp Pro Glu Gly Thr Gln Tyr Ile Arg Tyr Asp
1875 1880 1885

Gln Leu Ser Glu Phe Leu Asp Val Leu Glu Pro Pro Leu Gln Ile His
1890 1895 1900

Lys Pro Asn Lys Tyr Lys Ile Ile Ser Met Asp Met Pro Ile Cys Arg
1905 1910 1915 1920

Gly Asp Met Met Tyr Cys Val Asp Ile Leu Asp Ala Leu Thr Lys Asp
1925 1930 1935

Phe Phe Ala Arg Lys Gly Asn Pro Ile Glu Glu Thr Gly Glu Ile Gly
1940 1945 1950

Glu Ile Ala Ala Arg Pro Asp Thr Glu Gly Tyr Asp Pro Val Ser Ser
1955 1960 1965

Thr Leu Trp Arg Gln Arg Glu Glu Tyr Cys Ala Lys Leu Ile Gln Asn
1970 1975 1980

Ala Trp Arg Arg Tyr Lys Asn Gly Pro Pro Gln Glu Gly Asp Glu Gly
1985 1990 1995 2000

Glu Ala Ala Gly Gly Glu Asp Gly Ala Glu Gly Gly Glu Gly Glu Gly
2005 2010 2015

Gly Ser Gly Gly Gly Asp Asp Gly Gly Ser Ala Thr Gly Ala
2020 2025 2030

Thr Ala Ala Ala Gly Ala Thr Ser Pro Ser Asp Pro Asp Ala Gly Glu
2035 2040 2045

Ala Asp Gly Ala Ser Val Gly Gly Pro Leu Ser Pro Gly Cys Val Ser
2050 2055 2060

Gly Gly Ser Asn Gly Arg Gln Thr Ala Val Leu Val Glu Ser Asp Gly
2065 2070 2075 2080

Phe Val Thr Lys Asn Gly His Lys Val Val Ile His Ser Arg Ser Pro
2085 2090 2095

Ser Ile Thr Ser Arg Thr Ala Asp Val
2100 2105

<210> 4
<211> 2104
<212> PRT
<213> Musca domestica

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Arg Pro Phe Thr Arg Glu Ser Leu Leu Gln Ile Glu Gln Arg Ile Ala
20 25 30

Glu His Glu Lys Gln Lys Glu Leu Glu Arg Lys Arg Ala Ala Glu Gly
35 40 45

Glu Gln Ile Arg Tyr Asp Asp Glu Asp Glu Asp Glu Gly Pro Gln Pro
50 55 60

Asp Pro Thr Leu Glu Gln Gly Val Pro Ile Pro Val Arg Met Gln Gly

65

70

75

80

Ser Phe Pro Pro Glu Leu Ala Ser Thr Pro Leu Glu Asp Ile Asp Pro
85 90 95

Phe Tyr Ser Asn Val Leu Thr Phe Val Val Ile Ser Lys Gly Lys Asp
100 105 110

Ile Phe Arg Phe Ser Ala Ser Lys Ala Met Trp Leu Leu Asp Pro Phe
115 120 125

Asn Pro Ile Arg Arg Val Ala Ile Tyr Ile Leu Val His Pro Leu Phe
130 135 140

Ser Leu Phe Ile Ile Thr Thr Ile Leu Thr Asn Cys Ile Leu Met Ile
145 150 155 160

Met Pro Thr Thr Pro Thr Val Glu Ser Thr Glu Val Ile Phe Thr Gly
165 170 175

Ile Tyr Thr Phe Glu Ser Ala Val Lys Val Met Ala Arg Gly Phe Ile
180 185 190

Leu Cys Pro Phe Thr Tyr Leu Arg Asp Ala Trp Asn Trp Leu Asp Phe
195 200 205

Val Val Ile Ala Leu Ala Tyr Val Thr Met Gly Ile Asp Leu Gly Asn
210 215 220

Leu Ala Ala Leu Arg Thr Phe Arg Val Leu Arg Ala Leu Lys Thr Val
225 230 235 240

Ala Ile Val Pro Gly Leu Lys Thr Ile Val Gly Ala Val Ile Glu Ser
245 250 255

Val Lys Asn Leu Arg Asp Val Ile Ile Leu Thr Met Phe Ser Leu Ser
260 265 270

Val Phe Ala Leu Met Gly Leu Gln Ile Tyr Met Gly Val Leu Thr Gln
275 280 285

Lys Cys Ile Lys Arg Phe Pro Leu Asp Gly Ser Trp Gly Asn Leu Thr
290 295 300

Asp Glu Asn Trp Phe Leu His Asn Ser Asn Ser Ser Asn Trp Phe Thr
305 310 315 320

Glu Asn Asp Gly Glu Ser Tyr Pro Val Cys Gly Asn Val Ser Gly Ala

325	330	335
Gly Gln Cys Gly Glu Asp Tyr Val Cys Leu Gln Gly Phe Gly Pro Asn		
340	345	350
Pro Asn Tyr Asp Tyr Thr Ser Phe Asp Ser Phe Gly Trp Ala Phe Leu		
355	360	365
Ser Ala Phe Arg Leu Met Thr Gln Asp Phe Trp Glu Asp Leu Tyr Gln		
370	375	380
His Val Leu Gln Ala Ala Gly Pro Trp His Met Leu Phe Phe Ile Val		
385	390	395
Ile Ile Phe Leu Gly Ser Phe Tyr Leu Val Asn Leu Ile Leu Ala Ile		
405	410	415
Val Ala Met Ser Tyr Asp Glu Leu Gln Lys Lys Ala Glu Glu Glu		
420	425	430
Ala Ala Glu Glu Ala Ile Arg Glu Ala Glu Glu Ala Ala Ala Ala		
435	440	445
Lys Ala Ala Lys Leu Glu Glu Arg Ala Asn Val Ala Ala Gln Ala Ala		
450	455	460
Gln Asp Ala Ala Asp Ala Ala Ala Ala Leu His Pro Glu Met Ala		
465	470	475
Lys Ser Pro Thr Tyr Ser Cys Ile Ser Tyr Glu Leu Phe Val Gly Gly		
485	490	495
Glu Lys Gly Asn Asp Asp Asn Asn Lys Glu Lys Met Ser Ile Arg Ser		
500	505	510
Val Glu Val Glu Ser Glu Ser Val Ser Val Ile Gln Arg Gln Pro Ala		
515	520	525
Pro Thr Thr Ala Pro Ala Thr Lys Val Arg Lys Val Ser Thr Thr Ser		
530	535	540
Leu Ser Leu Pro Gly Ser Pro Phe Asn Leu Arg Arg Gly Ser Arg Ser		
545	550	555
Ser His Lys Tyr Thr Ile Arg Asn Gly Arg Gly Arg Phe Gly Ile Pro		
565	570	575
Gly Ser Asp Arg Lys Pro Leu Val Leu Gln Thr Tyr Gln Asp Ala Gln		

Gln His Leu Pro Tyr Ala Asp Asp Ser Asn Ala Val Thr Pro Met Ser	580	585	590
595	600	605	
Glu Glu Asn Gly Ala Ile Ile Val Pro Ala Tyr Tyr Cys Asn Leu Gly	610	615	620
625	630	635	640
Ser Arg His Ser Ser Tyr Thr Ser His Gln Ser Arg Ile Ser Tyr Thr	645	650	655
Ser His Gly Asp Leu Leu Gly Gly Met Ala Ala Met Gly Ala Ser Thr	660	665	670
Ile Gly Ala Ala Thr Asn Gly Gly Ser Ser Thr Ala Gly Gly Gly Tyr	675	680	685
Pro Asp Ala Asn His Lys Glu Gln Arg Asp Tyr Glu Met Gly Gln Asp	690	695	700
Tyr Thr Asp Glu Ala Gly Lys Ile Lys His His Asp Asn Pro Phe Ile	705	710	715
Glu Pro Val Gln Thr Gln Thr Val Val Asp Met Lys Asp Val Met Val	725	730	735
Leu Asn Asp Ile Ile Glu Gln Ala Ala Gly Arg His Ser Arg Ala Ser	740	745	750
Glu Arg Gly Glu Asp Asp Glu Asp Gly Pro Thr Phe Lys Asp Ile	755	760	765
Ala Leu Glu Tyr Ile Leu Lys Gly Ile Glu Ile Phe Cys Val Trp Asp	770	775	780
Cys Cys Trp Val Trp Leu Lys Phe Gln Glu Trp Val Ser Phe Ile Val	785	790	795
Phe Asp Pro Phe Val Glu Leu Phe Ile Thr Leu Cys Ile Val Val Asn	805	810	815
Thr Met Phe Met Ala Met Asp His His Asp Met Asn Pro Glu Leu Glu	820	825	830
Lys Val Leu Lys Ser Gly Asn Tyr Phe Phe Thr Ala Thr Phe Ala Ile			

835 840 845

Glu Ala Ser Met Lys Leu Met Ala Met Ser Pro Lys Tyr Tyr Phe Gln
 850 855 860

Glu Gly Trp Asn Ile Phe Asp Phe Ile Ile Val Ala Leu Ser Leu Leu
 865 870 875 880

Glu Leu Gly Leu Glu Gly Val Gln Gly Leu Ser Val Leu Arg Ser Phe
 885 890 895

Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn
 900 905 910

Leu Leu Ile Ser Ile Met Gly Arg Thr Met Gly Ala Leu Gly Asn Leu
 915 920 925

Thr Phe Val Leu Cys Ile Ile Ile Phe Ile Phe Ala Val Met Gly Met
 930 935 940

Gln Leu Phe Gly Lys Asn Tyr Ile Asp His Lys Asp Arg Phe Lys Asp
 945 950 955 960

His Glu Leu Pro Arg Trp Asn Phe Thr Asp Phe Met His Ser Phe Met
 965 970 975

Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile Glu Ser Met Trp Asp
 980 985 990

Cys Met Tyr Val Gly Asp Val Ser Cys Ile Pro Phe Phe Leu Ala Thr
 995 1000 1005

Val Val Ile Gly Asn Phe Val Val Leu Asn Leu Phe Leu Ala Leu Leu
 1010 1015 1020

Leu Ser Asn Phe Gly Ser Ser Ser Leu Ser Ala Pro Thr Ala Asp Asn
 1025 1030 1035 1040

Asp Thr Asn Lys Ile Ala Glu Ala Phe Asn Arg Ile Ala Arg Phe Lys
 1045 1050 1055

Asn Trp Val Lys Arg Asn Ile Ala Asp Cys Phe Lys Leu Ile Arg Asn
 1060 1065 1070

Lys Leu Thr Asn Gln Ile Ser Asp Gln Pro Ser Glu His Gly Asp Asn
 1075 1080 1085

Glu Leu Glu Leu Gly His Asp Glu Ile Met Gly Asp Gly Leu Ile Lys

1090 1095 1100
Lys Gly Met Lys Gly Glu Thr Gln Leu Glu Val Ala Ile Gly Asp Gly
1105 1110 1115 1120
Met Glu Phe Thr Ile His Gly Asp Met Lys Asn Asn Lys Pro Lys Lys
1125 1130 1135
Ser Lys Phe Ile Asn Asn Thr Thr Met Ile Gly Asn Ser Ile Asn His
1140 1145 1150
Gln Asp Asn Arg Leu Glu His Glu Leu Asn His Arg Gly Leu Ser Ile
1155 1160 1165
Gln Asp Asp Asp Thr Ala Ser Ile Asn Ser Tyr Gly Ser His Lys Asn
1170 1175 1180
Arg Pro Phe Lys Asp Glu Ser His Lys Gly Ser Ala Glu Thr Ile Glu
1185 1190 1195 1200
Gly Glu Glu Lys Arg Asp Val Ser Lys Glu Asp Leu Gly Leu Asp Glu
1205 1210 1215
Glu Leu Asp Glu Glu Ala Glu Gly Asp Glu Gly Gln Leu Asp Gly Asp
1220 1225 1230
Ile Ile Ile His Ala Gln Asn Asp Asp Glu Ile Ile Asp Asp Tyr Pro
1235 1240 1245
Ala Asp Cys Phe Pro Asp Ser Tyr Tyr Lys Lys Phe Pro Ile Leu Ala
1250 1255 1260
Gly Asp Glu Asp Ser Pro Phe Trp Gln Gly Trp Gly Asn Leu Arg Leu
1265 1270 1275 1280
Lys Thr Phe Gln Leu Ile Glu Asn Lys Tyr Phe Glu Thr Ala Val Ile
1285 1290 1295
Thr Met Ile Leu Met Ser Ser Leu Ala Leu Ala Leu Glu Asp Val His
1300 1305 1310
Leu Pro Asp Arg Pro Val Met Gln Asp Ile Leu Tyr Tyr Met Asp Arg
1315 1320 1325
Ile Phe Thr Val Ile Phe Phe Leu Glu Met Leu Ile Lys Trp Leu Ala
1330 1335 1340
Leu Gly Phe Lys Val Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe

1345 1350 1355 1360
 Val Ile Val Met Leu Ser Leu Ile Asn Leu Val Ala Val Trp Ser Gly
 1365 1370 1375
 Leu Asn Asp Ile Ala Val Phe Arg Ser Met Arg Thr Leu Arg Ala Leu
 1380 1385 1390
 Arg Pro Leu Arg Ala Val Ser Arg Trp Glu Gly Met Lys Val Val Val
 1395 1400 1405
 Asn Ala Leu Val Gln Ala Ile Pro Ser Ile Phe Asn Val Leu Leu Val
 1410 1415 1420
 Cys Leu Ile Phe Trp Leu Ile Phe Ala Ile Met Gly Val Gln Leu Phe
 1425 1430 1435 1440
 Ala Gly Lys Tyr Phe Lys Cys Lys Asp Gly Asn Asp Thr Val Leu Ser
 1445 1450 1455
 His Glu Ile Ile Pro Asn Arg Asn Ala Cys Lys Ser Glu Asn Tyr Thr
 1460 1465 1470
 Trp Glu Asn Ser Ala Met Asn Phe Asp His Val Gly Asn Ala Tyr Leu
 1475 1480 1485
 Cys Leu Phe Gln Val Ala Thr Phe Lys Gly Trp Ile Gln Ile Met Asn
 1490 1495 1500
 Asp Ala Ile Asp Ser Arg Glu Val Asp Lys Gln Pro Ile Arg Glu Thr
 1505 1510 1515 1520
 Asn Ile Tyr Met Tyr Leu Tyr Phe Val Phe Phe Ile Ile Phe Gly Ser
 1525 1530 1535
 Phe Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn
 1540 1545 1550
 Glu Gln Lys Lys Lys Ala Gly Gly Ser Leu Glu Met Phe Met Thr Glu
 1555 1560 1565
 Asp Gln Lys Lys Tyr Tyr Asn Ala Met Lys Lys Met Gly Ser Lys Lys
 1570 1575 1580
 Pro Leu Lys Ala Ile Pro Arg Pro Arg Trp Arg Pro Gln Ala Ile Val
 1585 1590 1595 1600
 Phe Glu Ile Val Thr Asp Lys Lys Phe Asp Ile Ile Ile Met Leu Phe

1605 1610 1615

Ile Gly Leu Asn Met Phe Thr Met Thr Leu Asp Arg Tyr Asp Ala Ser
 1620 1625 1630

Glu Ala Tyr Asn Asn Val Leu Asp Lys Leu Asn Gly Ile Phe Val Val
 1635 1640 1645

Ile Phe Ser Gly Glu Cys Leu Leu Lys Ile Phe Ala Leu Arg Tyr His
 1650 1655 1660

Tyr Phe Lys Glu Pro Trp Asn Leu Phe Asp Val Val Val Val Ile Leu
 1665 1670 1675 1680

Ser Ile Leu Gly Leu Val Leu Ser Asp Ile Ile Glu Lys Tyr Phe Val
 1685 1690 1695

Ser Pro Thr Leu Leu Arg Val Val Arg Val Ala Lys Val Gly Arg Val
 1700 1705 1710

Leu Arg Leu Val Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala
 1715 1720 1725

Leu Ala Met Ser Leu Pro Ala Leu Phe Asn Ile Cys Leu Leu Leu Phe
 1730 1735 1740

Leu Val Met Phe Ile Phe Ala Ile Phe Gly Met Ser Phe Phe Met His
 1745 1750 1755 1760

Val Lys Glu Lys Ser Gly Ile Asn Ala Val Tyr Asn Phe Lys Thr Phe
 1765 1770 1775

Gly Gln Ser Met Ile Leu Leu Phe Gln Met Ser Thr Ser Ala Gly Trp
 1780 1785 1790

Asp Gly Val Leu Asp Ala Ile Ile Asn Glu Glu Asp Cys Asp Pro Pro
 1795 1800 1805

Asp Asn Asp Lys Gly Tyr Pro Gly Asn Cys Gly Ser Ala Thr Val Gly
 1810 1815 1820

Ile Thr Phe Leu Leu Ser Tyr Leu Val Ile Ser Phe Leu Ile Val Ile
 1825 1830 1835 1840

Asn Met Tyr Ile Ala Val Ile Leu Glu Asn Tyr Ser Gln Ala Thr Glu
 1845 1850 1855

Asp Val Gln Glu Gly Leu Thr Asp Asp Asp Tyr Asp Met Tyr Tyr Glu

1860 1865 1870

Ile Trp Gln Gln Phe Asp Pro Glu Gly Thr Gln Tyr Ile Arg Tyr Asp
 1875 1880 1885

Gln Leu Ser Glu Phe Leu Asp Val Leu Glu Pro Pro Leu Gln Ile His
 1890 1895 1900

Lys Pro Asn Lys Tyr Lys Ile Ile Ser Met Asp Met Pro Ile Cys Arg
 1905 1910 1915 1920

Gly Asp Met Met Tyr Cys Val Asp Ile Leu Asp Ala Leu Thr Lys Asp
 1925 1930 1935

Phe Phe Ala Arg Lys Gly Asn Pro Ile Glu Glu Thr Gly Glu Ile Gly
 1940 1945 1950

Glu Ile Ala Ala Arg Pro Asp Thr Glu Gly Tyr Asp Pro Val Ser Ser
 1955 1960 1965

Thr Leu Trp Arg Gln Arg Glu Glu Tyr Cys Ala Lys Leu Ile Gln Asn
 1970 1975 1980

Ala Trp Arg Arg Tyr Lys Asn Gly Pro Pro Gln Glu Gly Asp Glu Gly
 1985 1990 1995 2000

Glu Ala Ala Gly Gly Glu Asp Gly Ala Glu Gly Gly Glu Gly Glu Gly
 2005 2010 2015

Gly Ser Gly Gly Gly Asp Asp Asp Gly Gly Ser Ala Thr Ala Ala
 2020 2025 2030

Gly Ala Thr Ser Pro Thr Asp Pro Asp Ala Gly Glu Ala Asp Gly Ala
 2035 2040 2045

Ser Ala Gly Asn Gly Gly Pro Leu Ser Pro Gly Cys Val Ser Gly
 2050 2055 2060

Gly Ser Asn Gly Arg Gln Thr Ala Val Leu Val Glu Ser Asp Gly Phe
 2065 2070 2075 2080

Val Thr Lys Asn Gly His Lys Val Val Ile His Ser Arg Ser Pro Ser
 2085 2090 2095

Ile Thr Ser Arg Thr Ala Asp Val
 2100

5' PROTEIN SYNTHESIS

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<210> 5
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      primers for PCR amplification of Vssc1 cDNAs.
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18

```
<210> 6
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
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<221> unsure
<222> (21)
<223> N at position 21 is either A, C, G, or T
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<400> 6
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26

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<210> 7
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
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<221> unsure
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<223> N at position 18 is either A, C, G, or T
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23

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<210> 8
<211> 18
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<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
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<210> 9
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
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primers for PCR amplification of Vssc1 cDNAs.

<220>
<221> unsure
<222> (17)
<223> N at any position in this sequence is A, C, G, or
T

<400> 9
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<210> 10
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
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<220>
<221> unsure
<222> (10)
<223> N at position 10 is either A, C, G, or T

<400> 10
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<210> 11
<211> 27
<212> DNA

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2
3
4
5
6
7
8
9

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primers for PCR amplification of Vsscl cDNAs.

<220>

<221> unsure

<222> (13)

<223> N at position 13 is either A, C, G, or T

<400> 11

gggtctagar gancaraara artayta

27

<210> 12

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primers for PCR amplification of Vsscl cDNAs.

<400> 12

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20

<210> 13

<211> 21

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
primers for PCR amplification of Vsscl cDNAs.

<400> 13

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21

<210> 14

<211> 21

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
primers for PCR amplification of Vsscl cDNAs.

<400> 14

actattgctt gtggtcgcca c 21

<210> 15
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<213> Artificial Sequence

<220>
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<220>
<221> unsure
<222> (5)
<223> N at any position in this sequence is A, C, G, or T

<400> 15
catcnttrgc ngcnttagacn atgac 25

<210> 16
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primers for PCR amplification of Vsscl cDNAs.

<400> 16
gattgaatgg atcgagcagc c 21

<210> 17
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
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<400> 17
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<210> 18
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<212> DNA
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T

<400> 18
ggagbgbggg nckbgnckn gctca 25

<210> 19
<211> 2100
<212> PRT
<213> Drosophila melanogaster

<400> 19
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Arg Pro Phe Thr Arg Glu Ser Leu Val Gln Ile Glu Gln Arg Ile Ala
20 25 30

Ala Glu His Glu Lys Gln Lys Glu Leu Glu Arg Lys Arg Ala Glu Gly
35 40 45

Glu Val Pro Arg Tyr Gly Arg Lys Lys Gln Lys Glu Ile Arg Tyr
50 55 60

Asp Asp Glu Asp Glu Asp Gly Pro Gln Pro Asp Pro Thr Leu Glu
65 70 75 80

Gln Gly Val Pro Ile Pro Val Arg Leu Gln Gly Ser Phe Pro Pro Glu
85 90 95

Leu Ala Ser Thr Pro Leu Glu Asp Ile Asp Pro Tyr Tyr Ser Asn Val
100 105 110

Leu Thr Phe Val Val Val Ser Lys Gly Lys Asp Ile Phe Arg Phe Ser
115 120 125

Ala Ser Lys Ala Met Trp Met Leu Asp Pro Phe Asn Pro Ile Arg Arg
130 135 140

Val Ala Ile Tyr Ile Leu Val His Pro Leu Phe Ser Leu Phe Ile Ile

145	150	155	160
Thr Thr Ile Leu Val Asn Cys Ile Leu Met Ile Met Pro Thr Thr Pro			
165	170		175
Thr Val Glu Ser Thr Glu Val Ile Phe Thr Gly Ile Tyr Thr Phe Glu			
180	185		190
Ser Ala Val Lys Val Met Ala Arg Gly Phe Ile Leu Cys Pro Phe Thr			
195	200		205
Tyr Leu Arg Asp Ala Trp Asn Trp Leu Asp Phe Val Val Ile Ala Leu			
210	215		220
Ala Tyr Val Thr Met Gly Ile Asp Leu Gly Asn Leu Ala Ala Leu Arg			
225	230		235
240			
Thr Phe Arg Val Leu Arg Ala Leu Lys Thr Val Ala Ile Val Pro Gly			
245	250		255
Leu Lys Thr Ile Val Gly Ala Val Ile Glu Ser Val Lys Asn Leu Arg			
260	265		270
Asp Val Ile Ile Leu Thr Met Phe Ser Leu Ser Val Phe Ala Leu Met			
275	280		285
Gly Leu Gln Ile Tyr Met Gly Val Leu Thr Glu Lys Cys Ile Lys Lys			
290	295		300
Phe Pro Leu Asp Gly Ser Trp Gly Asn Leu Thr Asp Glu Asn Trp Asp			
305	310		320
Tyr His Asn Arg Asn Ser Ser Asn Trp Tyr Ser Glu Asp Glu Gly Ile			
325	330		335
Ser Phe Pro Leu Cys Gly Asn Ile Ser Gly Ala Gly Gln Cys Asp Asp			
340	345		350
Asp Tyr Val Cys Leu Gln Gly Phe Gly Pro Asn Pro Asn Tyr Gly Tyr			
355	360		365
Thr Ser Phe Asp Ser Phe Gly Trp Ala Phe Leu Ser Ala Phe Arg Leu			
370	375		380
Met Thr Gln Asp Phe Trp Glu Asp Leu Tyr Gln Leu Val Leu Arg Ala			
385	390		395
400			
Ala Gly Pro Trp His Met Leu Phe Phe Ile Val Ile Ile Phe Leu Gly			

405 410 415

Ser Phe Tyr Leu Val Asn Leu Ile Leu Ala Ile Val Ala Met Ser Tyr
420 425 430

Asp Glu Leu Gln Arg Lys Ala Glu Glu Glu Ala Ala Glu Glu Glu
435 440 445

Ala Ile Arg Glu Ala Glu Glu Ala Ala Ala Lys Ala Ala Lys Leu
450 455 460

Glu Glu Arg Ala Asn Ala Gln Ala Gln Ala Ala Ala Asp Ala Ala Ala
465 470 475 480

Ala Glu Glu Ala Ala Leu His Pro Glu Met Ala Lys Ser Pro Thr Tyr
485 490 495

Ser Cys Ile Ser Tyr Glu Leu Phe Val Gly Gly Glu Lys Gly Asn Asp
500 505 510

Asp Asn Asn Lys Glu Lys Met Ser Ile Arg Ser Val Glu Val Glu Ser
515 520 525

Glu Ser Val Ser Val Ile Gln Arg Gln Pro Ala Pro Thr Thr Ala His
530 535 540

Gln Ala Thr Lys Val Arg Lys Val Ser Thr Thr Ser Leu Ser Leu Pro
545 550 555 560

Gly Ser Pro Phe Asn Ile Arg Arg Gly Ser Arg Ser Ser His Lys Tyr
565 570 575

Thr Ile Arg Asn Gly Arg Gly Arg Phe Gly Ile Pro Gly Ser Asp Arg
580 585 590

Lys Pro Leu Val Leu Ser Thr Tyr Gln Asp Ala Gln Gln His Leu Pro
595 600 605

Tyr Ala Asp Asp Ser Asn Ala Val Thr Pro Met Ser Glu Glu Asn Gly
610 615 620

Ala Ile Ile Val Pro Val Tyr Tyr Gly Asn Leu Gly Ser Arg His Ser
625 630 635 640

Ser Tyr Thr Ser His Gln Ser Arg Ile Ser Tyr Thr Ser His Gly Asp
645 650 655

Leu Leu Gly Gly Met Ala Val Met Gly Val Ser Thr Met Thr Lys Glu

660 665 670

Ser Lys Leu Arg Asn Arg Asn Thr Arg Asn Gln Ser Val Gly Ala Thr
675 680 685

Asn Gly Gly Thr Thr Cys Leu Asp Thr Asn His Lys Leu Asp His Arg
690 695 700

Asp Tyr Glu Ile Gly Leu Glu Cys Thr Asp Glu Ala Gly Lys Ile Lys
705 710 715 720

His His Asp Asn Pro Phe Ile Glu Pro Val Gln Thr Gln Thr Val Val
725 730 735

Asp Met Lys Asp Val Met Val Leu Asn Asp Ile Ile Glu Gln Ala Ala
740 745 750

Gly Arg His Ser Arg Ala Ser Asp Arg Gly Glu Asp Asp Asp Glu Asp
755 760 765

Gly Pro Thr Phe Lys Asp Lys Ala Leu Glu Val Ile Leu Lys Gly Ile
770 775 780

Asp Val Phe Cys Val Trp Asp Cys Cys Trp Val Trp Leu Lys Phe Gln
785 790 795 800

Glu Trp Val Ser Leu Ile Val Phe Asp Pro Phe Val Glu Leu Phe Ile
805 810 815

Thr Leu Cys Ile Val Val Asn Thr Met Phe Met Ala Met Asp His His
820 825 830

Asp Met Asn Lys Glu Met Glu Arg Val Leu Lys Ser Gly Asn Tyr Phe
835 840 845

Phe Thr Ala Thr Phe Ala Ile Glu Ala Thr Met Lys Leu Met Ala Met
850 855 860

Ser Pro Lys Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Phe Ile
865 870 875 880

Ile Val Ala Leu Ser Leu Leu Glu Leu Gly Leu Glu Gly Val Gln Gly
885 890 895

Leu Ser Val Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala
900 905 910

Lys Ser Trp Pro Thr Leu Asn Leu Leu Ile Ser Ile Met Gly Arg Thr

915

920

925

Met Gly Ala Leu Gly Asn Leu Thr Phe Val Leu Cys Ile Ile Ile Phe
930 935 940

Ile Phe Ala Val Met Gly Met Gln Leu Phe Gly Lys Asn Tyr His Asp
945 950 955 960

His Lys Asp Arg Phe Pro Asp Gly Asp Leu Pro Arg Trp Asn Phe Thr
965 970 975

Asp Phe Met His Ser Phe Met Ile Val Phe Arg Val Leu Cys Gly Glu
980 985 990

Trp Ile Glu Ser Met Trp Asp Cys Met Tyr Val Gly Asp Val Ser Cys
995 1000 1005

Ile Pro Phe Phe Leu Ala Thr Val Val Ile Gly Asn Leu Val Val Leu
1010 1015 1020

Asn Leu Phe Leu Ala Leu Leu Ser Asn Phe Gly Ser Ser Ser Leu
1025 1030 1035 1040

Ser Ala Pro Thr Ala Asp Asn Asp Thr Asn Lys Ile Ala Glu Ala Phe
1045 1050 1055

Asn Arg Ile Gly Arg Phe Lys Ser Trp Val Lys Arg Asn Ile Ala Asp
1060 1065 1070

Cys Phe Lys Leu Ile Arg Asn Lys Leu Thr Asn Gln Ile Ser Asp Gln
1075 1080 1085

Pro Ser Glu His Gly Asp Asn Glu Leu Glu Leu Gly His Asp Glu Ile
1090 1095 1100

Leu Ala Asp Gly Leu Ile Lys Lys Gly Ile Lys Glu Gln Thr Gln Leu
1105 1110 1115 1120

Glu Val Ala Ile Gly Asp Gly Met Glu Phe Thr Ile His Gly Asp Met
1125 1130 1135

Lys Asn Asn Lys Pro Lys Lys Ser Lys Tyr Leu Asn Asn Ala Thr Asp
1140 1145 1150

Asp Asp Thr Ala Ser Ile Asn Ser Tyr Gly Ser His Lys Asn Arg Pro
1155 1160 1165

Phe Lys Asp Glu Ser His Lys Gly Ser Ala Glu Thr Met Glu Gly Glu

1170	1175	1180
Glu Lys Arg Asp Ala Ser Lys Glu Asp Leu Gly Leu Asp Glu Glu Leu		
1185	1190	1195
Asp Glu Glu Gly Glu Cys Glu Glu Gly Pro Leu Asp Gly Asp Ile Ile		
1205	1210	1215
Ile His Ala His Asp Glu Asp Ile Leu Asp Glu Tyr Pro Ala Asp Cys		
1220	1225	1230
Cys Pro Asp Ser Tyr Tyr Lys Lys Phe Pro Ile Leu Ala Gly Asp Asp		
1235	1240	1245
Asp Ser Pro Phe Trp Gln Gly Trp Gly Asn Leu Arg Leu Lys Thr Phe		
1250	1255	1260
Arg Leu Ile Glu Asp Lys Tyr Phe Glu Thr Ala Val Ile Thr Met Ile		
1265	1270	1275
Leu Met Ser Ser Leu Ala Leu Ala Leu Glu Asp Val His Leu Pro Gln		
1285	1290	1295
Arg Pro Ile Leu Gln Asp Ile Leu Tyr Tyr Met Asp Arg Ile Phe Thr		
1300	1305	1310
Val Ile Phe Phe Leu Glu Met Leu Ile Lys Trp Leu Ala Leu Gly Phe		
1315	1320	1325
Lys Val Tyr Leu Thr Asn Ala Trp Cys Trp Leu Asp Phe Val Ile Val		
1330	1335	1340
Met Val Ser Leu Ile Asn Phe Val Ala Ser Leu Val Gly Ala Gly Gly		
1345	1350	1355
Ile Gln Ala Phe Lys Thr Met Arg Thr Leu Arg Ala Leu Arg Pro Leu		
1365	1370	1375
Arg Ala Met Ser Arg Met Gln Gly Met Arg Val Val Val Asn Ala Leu		
1380	1385	1390
Val Gln Ala Ile Pro Ser Ile Phe Asn Val Leu Leu Val Cys Leu Ile		
1395	1400	1405
Phe Trp Leu Ile Phe Ala Ile Met Gly Val Gln Leu Phe Ala Gly Lys		
1410	1415	1420
Tyr Phe Lys Cys Glu Asp Met Asn Gly Thr Lys Leu Ser His Glu Ile		

1425 1430 1435 1440
Ile Pro Asn Arg Asn Ala Cys Glu Ser Glu Asn Tyr Thr Trp Val Asn
1445 1450 1455
Ser Ala Met Asn Phe Asp His Val Gly Asn Ala Tyr Leu Cys Leu Phe
1460 1465 1470
Gln Val Ala Thr Phe Lys Gly Trp Ile Gln Ile Met Asn Asp Ala Ile
1475 1480 1485
Asp Ser Arg Glu Val Asp Lys Gln Pro Ile Arg Glu Thr Asn Ile Tyr
1490 1495 1500
Met Tyr Leu Tyr Phe Val Phe Phe Ile Ile Phe Gly Ser Phe Phe Thr
1505 1510 1515 1520
Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Glu Gln Lys
1525 1530 1535
Lys Lys Ala Gly Gly Ser Leu Glu Met Phe Met Thr Glu Asp Gln Lys
1540 1545 1550
Lys Tyr Tyr Ser Ala Met Lys Lys Met Gly Ser Lys Lys Pro Leu Lys
1555 1560 1565
Ala Ile Pro Arg Pro Arg Trp Arg Pro Gln Ala Ile Val Phe Glu Ile
1570 1575 1580
Val Thr Asp Lys Lys Phe Asp Ile Ile Ile Met Leu Phe Ile Gly Leu
1585 1590 1595 1600
Asn Met Phe Thr Met Thr Leu Asp Arg Tyr Asp Ala Ser Asp Thr Tyr
1605 1610 1615
Asn Ala Val Leu Asp Tyr Leu Asn Ala Ile Phe Val Val Ile Phe Ser
1620 1625 1630
Ser Glu Cys Leu Leu Lys Ile Phe Ala Leu Arg Tyr His Tyr Phe Ile
1635 1640 1645
Glu Pro Trp Asn Leu Phe Asp Val Val Val Val Ile Leu Ser Ile Leu
1650 1655 1660
Gly Leu Val Leu Ser Asp Ile Ile Glu Lys Tyr Phe Val Ser Pro Thr
1665 1670 1675 1680
Leu Leu Arg Val Val Arg Val Ala Lys Val Gly Arg Val Leu Arg Leu

1685

1690

1695

Val Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala Leu Ala Met
 1700 1705 1710

Ser Leu Pro Ala Leu Phe Asn Ile Cys Leu Leu Leu Phe Leu Val Met
 1715 1720 1725

Phe Ile Phe Ala Ile Phe Gly Met Ser Phe Phe Met His Val Lys Glu
 1730 1735 1740

Lys Ser Gly Ile Asn Asp Val Tyr Asn Phe Lys Thr Phe Gly Gln Ser
 1745 1750 1755 1760

Met Ile Leu Leu Phe Gln Met Ser Thr Ser Ala Gly Trp Asp Gly Val
 1765 1770 1775

Leu Asp Ala Ile Ile Asn Glu Glu Ala Cys Asp Pro Pro Asp Asn Asp
 1780 1785 1790

Lys Gly Tyr Pro Gly Asn Cys Gly Ser Ala Thr Val Gly Ile Thr Phe
 1795 1800 1805

Leu Leu Ser Tyr Leu Val Ile Ser Phe Leu Ile Val Ile Asn Met Tyr
 1810 1815 1820

Ile Ala Val Ile Leu Glu Asn Tyr Ser Gln Ala Thr Glu Asp Val Gln
 1825 1830 1835 1840

Glu Gly Leu Thr Asp Asp Asp Tyr Asp Met Tyr Tyr Glu Ile Trp Gln
 1845 1850 1855

Gln Phe Asp Pro Glu Gly Thr Gln Tyr Ile Arg Tyr Asp Gln Leu Ser
 1860 1865 1870

Glu Phe Leu Asp Val Leu Glu Pro Pro Leu Gln Ile His Lys Pro Asn
 1875 1880 1885

Lys Tyr Lys Ile Ile Ser Met Asp Ile Pro Ile Cys Arg Gly Asp Leu
 1890 1895 1900

Met Tyr Cys Val Asp Ile Leu Asp Ala Leu Thr Lys Asp Phe Phe Ala
 1905 1910 1915 1920

Arg Lys Gly Asn Pro Ile Glu Glu Thr Gly Glu Ile Gly Glu Ile Ala
 1925 1930 1935

Ala Arg Pro Asp Thr Glu Gly Tyr Glu Pro Val Ser Ser Thr Leu Trp

1940

1945

1950

Arg Gln Arg Glu Glu Tyr Cys Ala Arg Leu Ile Gln His Ala Trp Arg
1955 1960 1965

Lys His Lys Ala Arg Gly Glu Gly Gly Ser Phe Glu Pro Asp Thr
1970 1975 1980

Asp His Gly Asp Gly Gly Asp Pro Asp Ala Gly Asp Pro Ala Pro Asp
1985 1990 1995 2000

Glu Ala Thr Asp Gly Asp Ala Pro Ala Gly Gly Asp Gly Ser Val Asn
2005 2010 2015

Gly Thr Ala Glu Gly Ala Ala Asp Ala Asp Glu Ser Asn Val Asn Ser
2020 2025 2030

Pro Gly Glu Asp Ala
2035 2040 2045

Ala Ala Gly Thr Thr Ala Gly Ser Pro Gly Ala Gly Ser Ala Gly
2050 2055 2060

Arg Gln Thr Ala Val Leu Val Glu Ser Asp Gly Phe Val Thr Lys Asn
2065 2070 2075 2080

Gly His Lys Val Val Ile His Ser Arg Ser Pro Ser Ile Thr Ser Arg
2085 2090 2095

Thr Ala Asp Val
2100